

### **REMARKS**

Applicants respond to the Office Action dated May 28, 2008. Claims 1-15 are pending in the application.

Applicants wish to thank the Examiner for taking the time to conduct a telephone interview with Applicants' undersigned representative on August 7, 2008.

#### **I. REJECTION UNDER 35 USC §102(b)**

Claims 1-4 and 7 have been rejected under 35 U.S.C. §102(b) as being anticipated by Dakin (US 2003/0102808). The Examiner contends that Dakin discloses the claimed metal halide lamp, including the composition of the gas filled in the tube that satisfies the relationships of  $0.4 \leq Hc/Hp \leq 15.0$  and  $3.0 \leq Hn/Hp \leq 25.0$ .

Applicants respectfully disagree with the Examiner's contention. Dakin fails to teach or suggest the specific relationship between the praseodymium halide, the sodium halide and the calcium halide within the arc tube as claimed by Applicants. Dakin discloses in paragraph [0024] a list of 17 rare earth elements for the rare earth metal halide (RE halide) and 3 alkaline earth metals for the alkaline earth metal halide. According to Dakin, therefore, there are 131,071 (i.e.,  $2^{17}-1$ ) possible combinations of rare earth metal elements for the RE halide and 7 (i.e.,  $2^3-1$ ) possible combinations of alkaline earth metals for the alkaline earth metal halide. Thus within the disclosure of Dakin, one skilled in the art would have to choose from among 917,497 (i.e.,  $131,071 \times 7$ ) possible combinations of RE halides and alkaline earth metal halides to arrive at Applicants' claimed fill combination of Pr as the rare earth and Ca as the alkaline earth. It would not have been reasonable for one skilled in the art to test all 917,497 of the possible variations of Dakin, particularly since Dakin specifically teaches that the preferred rare earth metal is a combination of Ho, Dy and Tm. Furthermore, Dakin states that "the inclusion of at least three rare earths have been shown to be beneficial" (See paragraph [0026]). The molar fraction of RE halide shown in the table

of paragraph [0025] of Dakin recites a range of >0-15; preferably 4-8%. This recited range is for the total amount of the rare earths metal halides of the RE halide mixture, which is disclosed as including at least three rare earths (See paragraph [0026]). Dakin simply does not teach or suggest a metal halide lamp that includes a Pr halide, a Na halide and a Ca halide wherein the Pr halide content  $H_p$ , the Na halide content  $H_n$  and the Ca halide content  $H_c$  satisfy the specific relationships of  $0.4 \leq H_c/H_p \leq 15.0$  and  $3.0 \leq H_n/H_p \leq 25.0$ . Accordingly, Applicants respectfully submit that the rejection of claims 1-4 and 7 under 35 U.S.C. §102(b) should be withdrawn.

Applicants further submit that claimed metal halide lamp would not have been obvious based on the teachings of Dakin. The metal halide lamp of Applicants' claimed invention possesses unexpectedly superior properties. Specifically, Applicants have discovered that the metal halide lamp containing Pr halide, Na halide and Ca halide in amounts that satisfy the recited relationships exhibit superior lamp efficiency over conventional lamps, such as the metal halide lamp of Dakin. The superior lamp efficiency is demonstrated in FIG. 3, which is a plot of lamp efficiency [LPW] vs. the ratio of the inter-electrode distance  $L$  and the inner diameter  $D$  [ $L/D$ ]. The conventional metal halide lamp used as a basis of comparison includes as the enclosed substances the iodides of Na, Ca, Tl, Ho, Dy and Tm (page 16, lines 2-13). As shown in FIG. 3, the lamp efficiency of the conventional lamp is about 90 LPW, irrespective of  $L/D$ . The lamps of the present invention exhibit an efficiency that is much greater than that of the conventional lamp, particularly when  $L/D$  is greater than or equal to 1 (See curves for  $H_c/H_p = 0.5$ ,  $H_c/H_p = 2$  and  $H_c/H_p = 10$  in FIG. 3.) Furthermore, the lamps of the present invention exhibit a  $R_a$  of 70 to 90 when  $L/D \geq 1$ , indicating a very high color rendition (page 16, line 14 to page 17, line 3). In view of the unexpectedly superior results of the metal halide lamp claimed over conventional lamps as disclosed by Dakin, the metal halide lamp as claimed by Applicants would not have been obvious based on the teachings of Dakin. Because Dakin et al. neither

anticipates nor renders obvious the metal halide lamp of claims 1-4 and 7, Applicants respectfully request withdrawal of the rejection and allowance of claims 1-4 and 7.

## II. REJECTIONS UNDER 35 USC 103(a)

Claims 5-6 and 8-15 have been rejected under 35 USC §103(a) based on Dakin et al. in combination with one or more secondary references. Applicants respectfully request withdrawal of the rejections for at least the following reasons.

As discussed above, Dakin et al. fail to disclose, teach or suggest a metal halide lamp that includes a Pr halide, a Na halide and a Ca halide wherein the Pr halide content  $H_p$ , the Na halide content  $H_n$  and the Ca halide content  $H_c$  satisfy the specific relationships of  $0.4 \leq H_c/H_p \leq 15.0$  and  $3.0 \leq H_n/H_p \leq 25.0$ . Furthermore, the claimed metal halide lamp of the present invention exhibits unexpectedly superior properties over conventional lamps such as that taught by Dakin et al. There is nothing in any of the cited secondary references that cures the deficiencies of Dakin et al. Applicants respectfully request withdrawal of the rejection of claims 5-6 and 8-15 under 35 U.S.C. §103(a).

## III. CONCLUSION

Accordingly, all claims 1-15 are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional

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extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,

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